

REMARKS

By an Office Action dated June 7, 2004 in the file of this application the Examiner rejected the application based on a combination of prior art references. By this response, the applicants respond to those grounds of rejection. Based on the changes to the claims made above and the comments presented herewith, reconsideration of the merits of this patent application is respectfully requested.

As a precedent matter there was a rejection in the previous Office Action under 35 U.S.C. §112, second paragraph, for indefiniteness based on the use of the words "duty cycle." The claim has been reworded in a way so as to remove that language thus obviating this ground of rejection.

The main rejection applied against the claims of this application was a combination rejection based on references to Garner, a patent to Baker, and a published US patent application to MacAulay. The applicants respectfully traverses this ground of rejection.

The applicants agree that Garner teaches a method of synthesizing arrays of oligonucleotides by illuminating synthesis areas using a micromirror array to remove protecting groups during the synthesis of the oligonucleotides. The applicants also agree that Baker teaches a method of illumination quality control comprising illuminating two areas with a micromirror and creating a gray scale mask to provide for corrections of non-uniform illumination. This subject matter is no longer claimed in this present application.

MacAulay is directed to adjusting excitation light used during the reading of a microarray. The applicants disagree that the teaching of MacAulay makes obvious the method of the present invention, whether or not taken in conjunction with the other references cited against the claims of this application. MacAulay teaches nothing about microarray synthesis.

First, the filing date of the MacAulay application is after the filing date of the present application. MacAulay claims priority to a provisional application which the Examiner has provided. The provisional application does describe using micromirrors and does describe using changes in intensity of micromirrors for the purpose of changing the intensity delivered to a microarray during the reading of the microarray. Nothing in the MacAulay patent, or its provisional application, deals with the problems present in synthesizing microarray oligonucleotides. Nowhere in the MacAulay application, or in the provisional, is the concept of directing light to the microarray for only a portion of a deprotection period described. The purpose and intension of the MacAulay disclosure is to assist in reading microarray elements after a hybridization experiment, to increase the signal-to-noise ratio. While MacAulay uses

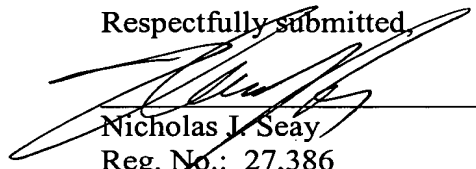
a micromirror to solve the problem of signal-to-noise ratio in microarray reading, it is asserted by the applicants now that this does not make obvious the applicants' use of a "duty cycle" approach in micromirror utilization during the synthesis of DNA oligonucleotides as a part of microarray synthesis.

Note that both the claims of the present invention make it clear that the adjustment of micromirror elements to direct light to and from synthesis areas is made during a deprotection time period. The deprotection period is recited in the specification (paragraph 26) and is a part of the total oligonucleotide synthesis process needed to create a microarray. During that specific deprotection step time period, the micromirrors which direct light to a particular synthesis area which would otherwise be too bright, are switched off for a portion of the time so the total light delivered to the synthesis area corresponds to the light that is delivered to a otherwise less brightly illuminated synthesis area. This strategy is not shown in MacAulay and is not shown in the other two references cited by the Examiner. This is a novel step, not shown in the prior art, and which enables microarray synthesis to be conducted with greater uniformity and specificity. Accordingly, the method of the claims of this present application are not made obvious by the combination of the references cited by the Examiner.

Accordingly, reconsideration of the merits of this patent application is respectfully requested.

Based on the foregoing, the Examiner is respectfully requested to revisit the merits of this patent application. A separate petition for extension of time and a request for continued examination are submitted herewith so that this response will be considered as timely filed and so that the Examiner can revisit the merits of this patent application.

Respectfully submitted,



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